

Ejercicios

1- Calcular: $I = \int x^8 dx$

$$I = \frac{x^{8+1}}{8+1} + C \rightarrow I = \frac{x^9}{9} + C$$

$$= \frac{1}{9} x^9 + C //$$

2- $\int (a + bx^3)^2 dx$

$$\int (a + bx^3)^2 dx = \int (a^2 + 2abx^3 + b^2x^6) dx$$

$$= \int a^2 dx + \int 2abx^3 dx + \int b^2x^6 dx$$

$$= a^2 \int dx + 2ab \int x^3 dx + b^2 \int x^6 dx = a^2x + 2ab \frac{x^4}{4} + b^2 \frac{x^7}{7} + C$$

$$= \int (a + bx^3)^2 dx = a^2x + \frac{abx^4}{2} + \frac{b^2x^7}{7} + C$$

3- $\int x(x+a)(x+b) dx$

$$\int x(x+a)(x+b) dx = \int x [x^2 + (a+b)x + ab] dx$$

$$= \int [x^3 + (a+b)x^2 + abx] dx$$

$$= \int x^3 dx + \int (a+b)x^2 dx + \int abx dx = \int x^3 dx + (a+b) \int x^2 dx + ab \int x dx$$

$$= \frac{x^4}{4} + (a+b) \frac{x^3}{3} + ab \frac{x^2}{2} + C$$

4- $\int \frac{1}{4x-9} dx$

$$\int \frac{1}{4x-9} dx = \int \frac{1}{4} \cdot \frac{1}{4x-9} dx = \frac{1}{4} \int \frac{1}{4x-9} dx = \frac{1}{4} \ln |4(4x-9)| + C$$

5- $\int (4x^3 + x^2) dx$

$$\int (4x^3 + x^2) dx = \int 4x^3 dx + \int x^2 dx = \frac{4}{3+1} x^{3+1} + \frac{1}{3} x^{2+1} + C$$

$$= \frac{4}{4} x^4 + \frac{1}{3} x^3 + C = x^4 + \frac{1}{3} x^3 + C$$

$$6: \int x^4(5-x^2) dx$$

$$\int x^4(5-x^2) dx = \int (5x^4 - x^6) dx$$

$$\int (5x^4 - x^6) dx = \int 5x^4 dx - \int x^6 dx = \frac{5}{4+1} x^{4+1} - \frac{1}{6+1} x^{6+1} + C =$$

$$= \frac{5}{5} x^5 - \frac{1}{7} x^7 + C$$

$$7: \int (2+3x^2-8x^3) dx$$

$$\int (2+3x^2-8x^3) dx = \int 2 dx + \int 3x^2 dx - \int 8x^3 dx$$

$$\int (8x^4+4x^3-6x^2-4x+5) dx = 2x + \frac{3}{2+1} x^{2+1} - \frac{8}{3+1} x^{3+1} + C$$

$$\int (8x^4+4x^3-6x^2-4x+5) dx = 2x + \frac{3}{3} x^3 - \frac{8}{4} x^4 + C$$

$$\int (8x^4+4x^3-6x^2-4x+5) dx = 2x + x^3 - 2x^4 + C$$

$$8: \int (4x^3-3x^2+6x-1) dx$$

$$\int (4x^3-3x^2+6x-1) dx = \int 4x^3 dx - \int 3x^2 dx + \int 6x dx - \int dx$$

$$\int (4x^3-3x^2+6x-1) dx = \frac{4}{3+1} x^{3+1} - \frac{3}{2+1} x^{2+1} + \frac{6}{1+1} x^{1+1} - x + C$$

$$\int (4x^3-3x^2+6x-1) dx = \frac{4}{4} x^4 - \frac{3}{3} x^3 + \frac{6}{2} x^2 - x + C$$

$$\int (4x^3-3x^2+6x-1) dx = x^4 - x^3 + 3x^2 - x + C$$

$$9: \int (ax^2+bx+c) dx$$

$$\int (ax^2+bx+c) dx = \int ax^2 dx + \int bxdx + \int c dx$$

$$= \frac{a}{2+1} x^{2+1} + \frac{b}{1+1} x^{1+1} + cx + C = \frac{a}{3} x^3 + \frac{b}{2} x^2 + cx + C$$

$$10: \int x^3(2x^2-3) dx$$

$$\int x^3(2x^2-3) dx = \int (2x^5-3x^3) dx$$

$$\int (2x^5-3x^3) dx = \int 2x^5 dx - \int 3x^3 dx = \frac{2}{5+1} x^{5+1} - \frac{3}{3+1} x^{3+1} + C$$

$$= \frac{2}{6} x^6 - \frac{3}{4} x^4 + C$$

$$\int x^3(2x^2-3) dx = \frac{1}{3} x^6 - \frac{3}{4} x^4 + C$$